



A CSW Industrials Company

# PRO-Fit™ Quick Connect

Push-to-Connect Refrigerant Fittings for Residential Application



# Push-to-connect refrigerant fittings



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## Flame-free fittings for connecting refrigerant lines



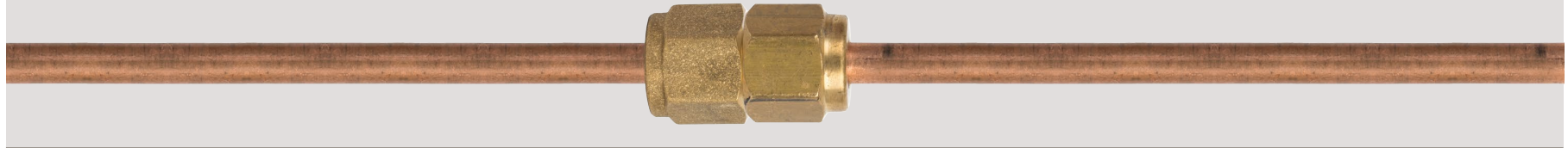
# Challenges of refrigerant line connections

## Poor flaring can lead to refrigerant leaks.

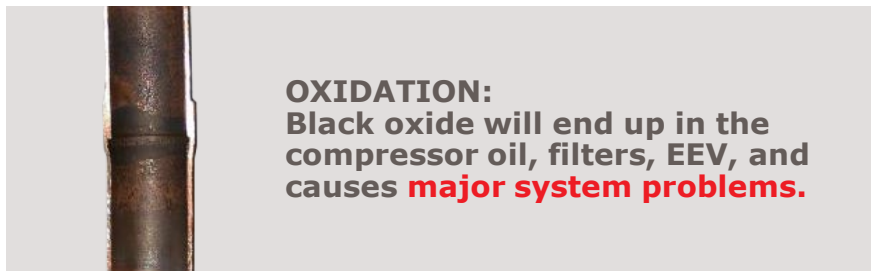


## Incorrect torque can result in refrigerant leaks.

Flare connections can leak refrigerant over time due to **over or under tightening the flare nut**.



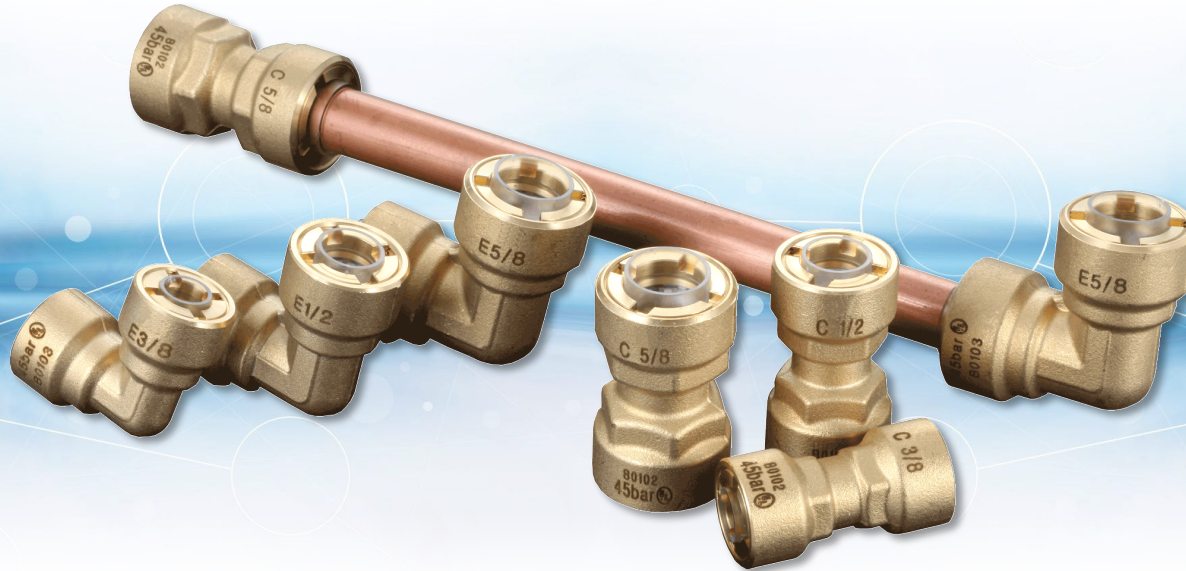
## Improper brazing can lead to oxidation and damage to the entire system.



# Why PRO-Fit™ Quick Connect?



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## Quick Install

Flame-free  
Push-in connections  
Quick release removal

## Durable

Brass body  
Leak-resistant  
Tested and UL verified

## Versatile

Complete system  
Copper and coated  
aluminum linesets  
  
Mini-splits and  
unitary systems



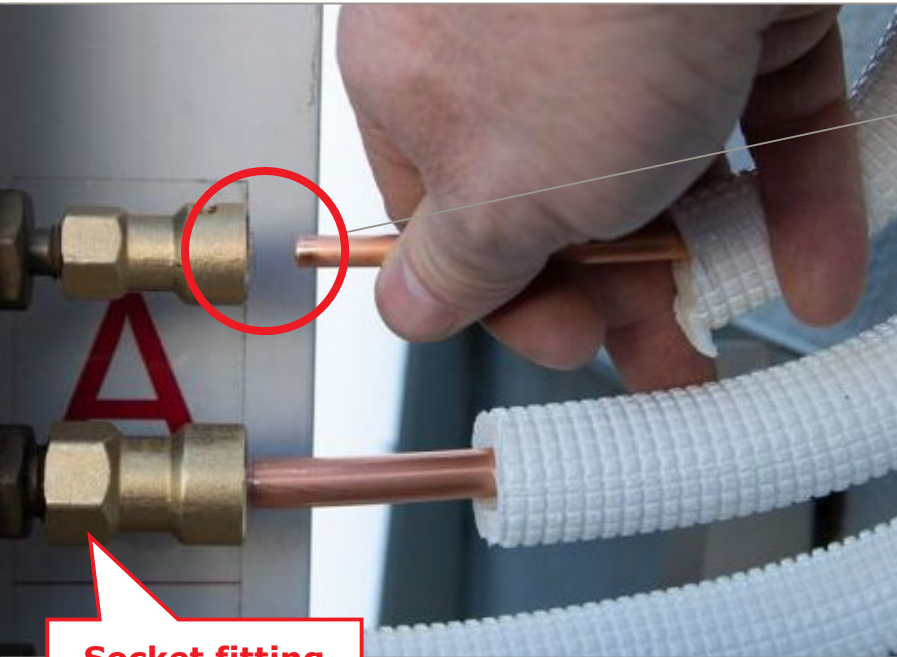
## Flame-free connections

No flaring or brazing needed



## Sight window

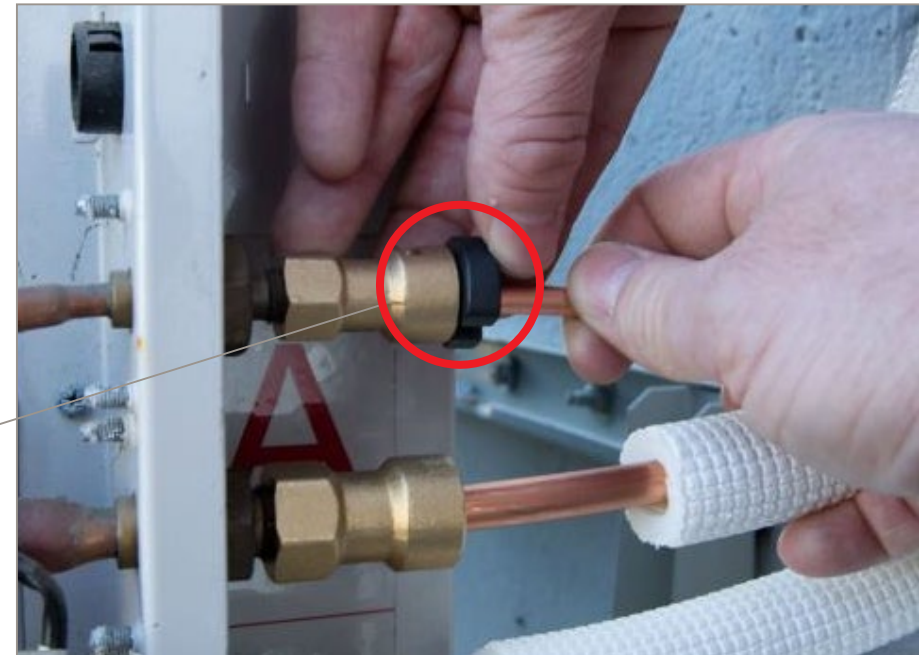
Visually verify pipe seating



**Socket fitting**

## Push-in connection

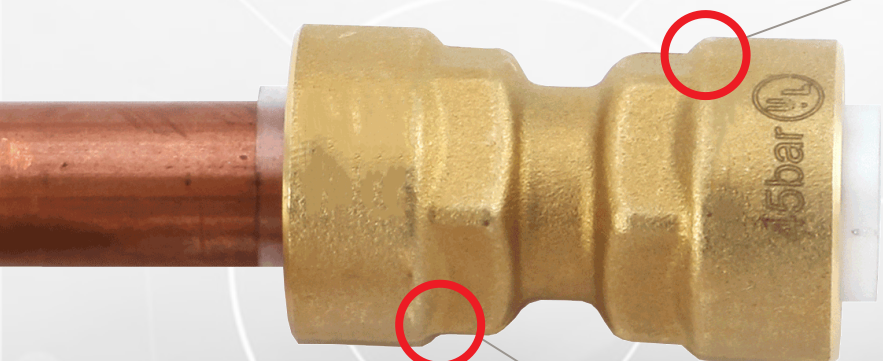
Cut, de-burr, mark insertion depth, then push piping into the fitting.



## Easy release removal

Place the release tool against the fitting and pull the piping from the fitting.

NOTE: Ensure the refrigerant has been pumped from the system before disconnecting linesets.



## **Brass body**

Robust, durable, reliable



## **Double o-ring sealing**

High performance chloroprene elastomer is resistant to leaks and refrigerant.

## Thoroughly tested. UL verified and certified.

### UL157

O-ring chemical compatibility test

### UL207

Strength test  
Pressure test  
Ammonia air stress cracking test

### UL250

Accelerated aging test – electrical heaters

### UL1963

Vibration test  
Pull test

#### External Testing

Fatigue testing

Chemical compatibility test

Salt spray test

#### Internal Testing

Long term leak test

Vibration test

Test on A/C unit

Tube bend

Burst pressure

Tensile strength

Reusability

Helium leak test



# UL157 O-ring chemical compatibility test



**O-ring evaluated did not shrink by more than 1% or swell by more than 25%** when exposed to R-410A and POE lubricant for 14 days at a temperature of 130°C. This pass/fail criteria was set to comply with the criteria stated in UL157.

## Dimensional change

Elastomer (mm)	Pre			Post		
	Thickness	ID	OD	Thickness	ID	OD
Average	3.01	12.24	17.76	3.04	12.07	18.72
<b>Dimensional change</b>				<b>+1%</b>	<b>-1%</b>	<b>+5%</b>

## Volume change

Elastomer (g)	Pre dry mass M1	Pre wet mass M2	Post dry mass M3	Post wet mass M4	Volume change
Test sample average	0.5069	0.1581	0.5615	0.1552	<b>+16%</b>

## Mass change

Elastomer (g)	Pre mass	Post mass	Mass change
Test sample average	0.5069	0.5615	<b>+11%</b>

# UL207 strength and fatigue tests



## Strength and fatigue testing of refrigerant pipe couplers

Test description	Standard	Section	Result
Strength test	UL 207	13	Passed
Fatigue test	UL 207	14	Passed

### **Meets requirements contained within UL 207**

DEI Issued: 2009/04/20 Ed: 8 Rev: 2014/06/27 Refrigerant-Containing Components and Accessories, Nonelectrical

# UL1963 vibration test

## Test conditions

- Maintaining internal 50psi pressure
- Amplitude 3.18mm, frequency of vibration 17Hz
- X, Y, and Z axes are vibrated for 16 hours each (48 hours total)

## Tested fittings

- 1/4", 3/8", 1/2", 5/8" union fittings (2 of each)
- 1/4", 3/8", 1/2", 5/8" elbow fittings (2 of each)

## Criteria for judgement

- No leaks



Type	Result
1/4" Union 1/4" Elbow	Passed
3/8" Union 3/8" Elbow	Passed
1/2" Union 1/2" Elbow	Passed
5/8" Union 5/8" Elbow	Passed

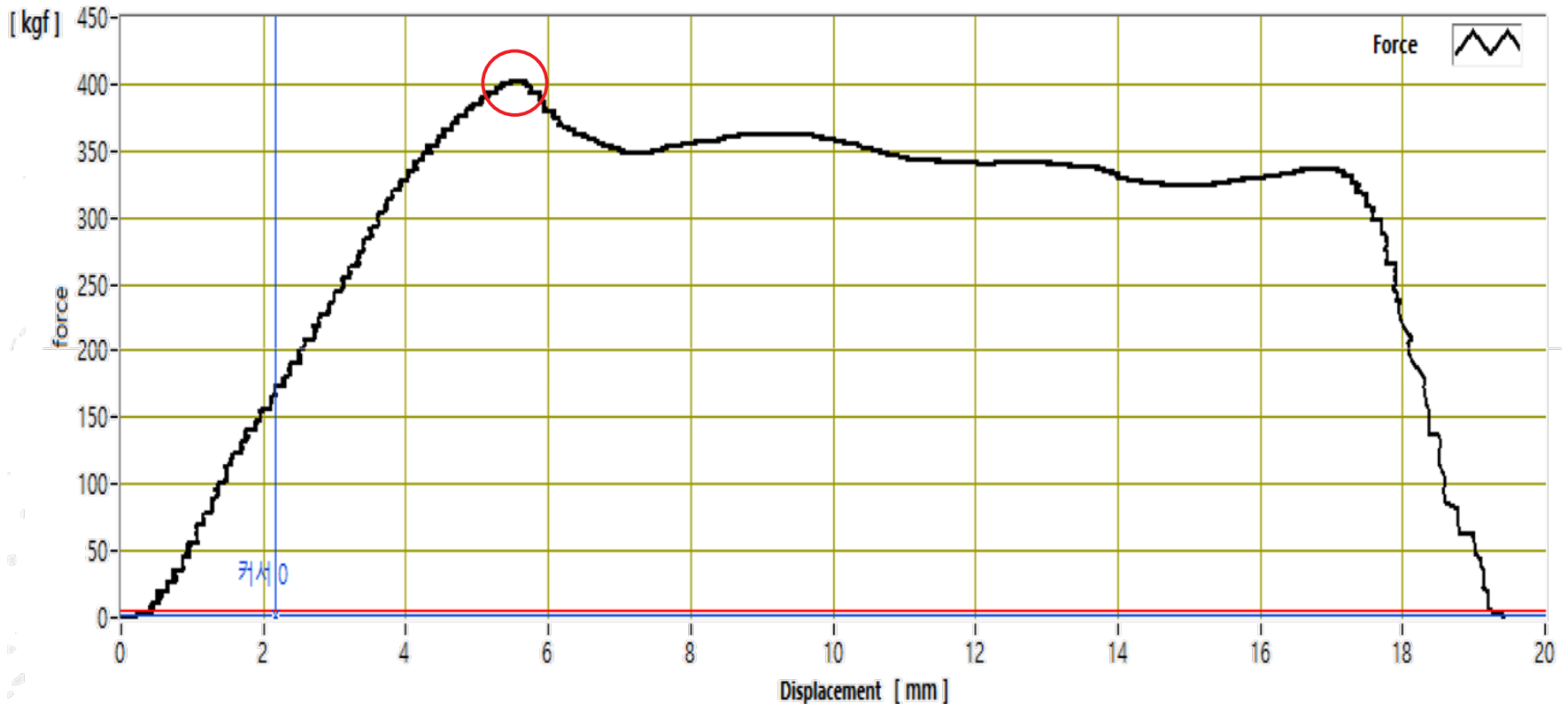
**Union and elbow pass all standard examination.**

**Test results:  
No leakage  
(No pressure reduction)**

# UL1963 tensile test (tube pull out test)

Test item	Pull-out start	Pull-out point	UL pull test standard
5/8" union	340kgf (4,835.9psi)	401.2kgf (5703.6psi)	54.4kgf (773.8psi)

**Over 7 times higher tensile strength than UL standard!**





# Leakage rate



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Test type	Test contents	Test standard	Result
Thermal shock test	R-143A refrigerant -26°C/4hr → 49°C/4hr; 1 cycle 5 cycle	1.5g/yr ↓	Passed

## Installation test

Sample	Description	Refrigerant	Leakage (g/day)	Leakage (g/year)
1	1/2" elbow	R-410A	0.00014	0.051
2	1/2" elbow	R-410A	ND*	ND*
3	1/2" elbow	R-410A	ND*	ND*
4	1/2" elbow	R-410A	ND*	ND*
5	1/2" elbow	R-448A	0.00030	0.110
6	1/2" elbow	R-448A	ND*	ND*
7	1/2" elbow	R-448A	0.00002	0.007
8	1/2" elbow	R-448A	ND*	ND*
9	1/4" elbow	R-410A	ND*	ND*
10	1/4" elbow	R-410A	ND*	ND*
11	1/4" elbow	R-410A	ND*	ND*
12	1/4" elbow	R-410A	ND*	ND*
13	1/4" elbow	R-448A	ND*	ND*
14	1/4" elbow	R-448A	ND*	ND*
15	1/4" elbow	R-448A	ND*	ND*
16	1/4" elbow	R-448A	ND*	ND*
17	1/4" union	R-410A	ND*	ND*
18	1/4" union	R-410A	0.00080	0.291
19	1/4" union	R-410A	0.00004	0.014
20	1/4" union	R-410A	ND*	ND*

## Reinstallation test

Sample	Description	Refrigerant	Leakage (g/day)	Leakage (g/year)
1	1/2" elbow	R-410A	0.00095	0.347
2	1/2" elbow	R-410A	0.00066	0.240
3	1/2" elbow	R-410A	0.00072	0.263
4	1/2" elbow	R-410A	0.00072	0.263
5	1/2" elbow	R-448A	0.00064	0.233
6	1/2" elbow	R-448A	0.00058	0.211
7	1/2" elbow	R-448A	0.00056	0.205
8	1/2" elbow	R-448A	0.00168	0.614
9	1/4" elbow	R-410A	0.00034	0.123
10	1/4" elbow	R-410A	0.00042	0.154
11	1/4" elbow	R-410A	0.00031	0.112
12	1/4" elbow	R-410A	ND*	ND*
13	1/4" elbow	R-448A	ND*	ND*
14	1/4" elbow	R-448A	0.00089	0.313
15	1/4" elbow	R-448A	ND*	ND*
16	1/4" elbow	R-448A	ND*	ND*
17	1/4" union	R-410A	0.00059	0.216
18	1/4" union	R-410A	ND*	ND*
19	1/4" union	R-410A	0.00033	0.119
20	1/4" union	R-410A	0.00066	0.242

NOTE: "Intertek" test report; \*Non-detect. Detection limit estimated 0.004g/yr for R-410A, 0.007g/yr for R-448A.

# Thirteen (13) types of reliability test



Test type	Test contents	Test standard	Result
<b>Leakage</b>	Applying test pressure of 4.2 Mpa	No leakage allowed	✓
<b>Hydraulic</b>	Applying 1.5 times of water pressure (6.3 Mpa/63 bar) higher than design pressure for 1 min.	No leakage on spindle on/off allowed	✓
<b>Burst pressure</b>	Applying 3 times of water pressure (12.6 Mpa/126 bar) higher than design pressure	No leakage and destroy allowed	✓
<b>Flow</b>	Pressure drop 0.01MPa, amount of fluid	Satisfied with KS	✓
<b>Impact resistance</b>	Dropping specimen of pipe connection in X, Y, Z direction 1 meter off concrete floor	No deformation, destroy and leakage allowed	✓
<b>Durability</b>	Doing Stem On-Off 10 times, 4.2MPa leakage test	No leakage	✓
<b>Ammonia</b>	Cleaning after exposure to ammonia for two hours	No crack	✓
<b>Salt spray</b>	Following KS D 9502, testing union by salt water spray tester for 48 hours.	No defective allowed (crack, swelling)	✓
<b>High temp. resistance</b>	Injecting mixed fluid of R410A and refrigeration oil in the weight ratio of 7 to 3. Setting environment as 4.2 MPa (42 Bar) at 120 ° C and to be seen for 72 hours	No leakage allowed	✓
<b>Low temp. resistance</b>	Injecting mixed fluid of R410A and refrigeration oil in the weight ratio of 7 to 3. Setting environment as 4.2 MPa (42 Bar) at -30 ° C and to be seen for 72 hours	No leakage allowed	✓
<b>Thermal shock test</b>	Injecting mixed fluid of R410A and refrigeration oil in the weight ratio of 7 to 3. To be followed in order of 120°C/1hr, -35°C/1hr (42kg/cm <sup>2</sup> ) 1Cycle. 40Cycle required	No leakage allowed	✓
<b>Vibration test</b>	At 2.2G Acceleration, Vibration width 1mm, 3 exes, each 4 hours repeat	No leakage allowed	✓
<b>Environmental test (UV)</b>	UV 8,760Hours (365days) Exposed	No leakage allowed	✓

## Complete system with a wide selection of sizes and fittings



Union



90°  
elbow



Reducer



90° elbow  
reducer



Socket



Service  
valve

	Union	90° elbow	Reducer	90° elbow reducer	Socket	Service valve
1/4"	●	●	●	●	●	●
3/8"	●	●	●	●	●	●
1/2"	●	●	●	●	●	●
5/8"	●	●	●	●	●	●
3/4"	●	●			TBD	TBD
7/8"	●	●			TBD	TBD

NOTE: Other fittings are available, if there is a need for a customer, we can look at bringing in a smaller quantity.

**Compatible with mini-split ductless and unitary ducted residential systems**



**Multi-family or commercial applications are not recommended or covered by warranty.**

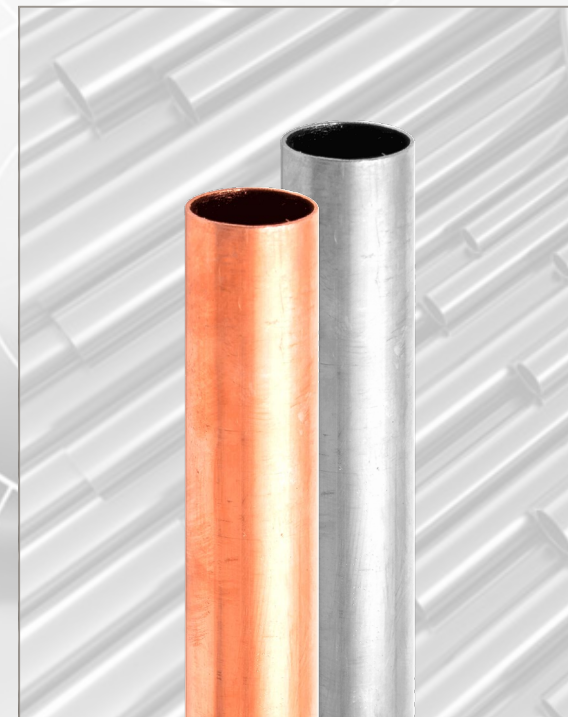
**Allows HCFC and HFC refrigerants**

**R134a, R404A, R290, R500, R407A, R600a, R22, R410A, R407C, R32**



**Maximum rated pressure: 653psi (45bar) ~ 870psi (60bar)**

**Works with copper and coated aluminum\* linesets**



**\*To avoid galvanic corrosion, do not use uncoated aluminum linesets directly with fittings.**



# ZoomLock/Conex comparison



**Installation tools**

None needed

Tool required

**Seal**

Double o-ring seal

Metal on metal;  
one o-ring seal

**Application**

Residential  
(single family)

Commercial

**Merchandising**

Individually  
merchandised

Boxed

**Cost**

Higher cost per fitting

Higher total cost with  
required tool



**Cost effective, flexible solution for smaller, residential projects.**



**Solution for larger, commercial projects.**

# Cross-sell products: Support kits



Code	Support kits	Qty
87048	1/4", 3/8", 1/2", 5/8" disconnect clips; 1/4"—5/8" line marking tool	10
87049	3/4" and 7/8" disconnect/line marking tool	10

# Model numbers



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Code	Description	Qty
87018	1/4" union	10
87019	3/8" union	10
87020	1/2" union	10
87021	5/8" union	10
87022	3/4" union	10
87023	7/8" union	10
87024	1/4" elbow	10
87025	3/8" elbow	10
87026	1/2" elbow	10
87027	5/8" elbow	10
87028	3/4" elbow	10
87029	7/8" elbow	10
87030	1/4" to 3/8" reducer	10
87031	3/8" to 1/2" reducer	10
87032	1/2" to 5/8" reducer	10

Code	Description	Qty
87033	1/4" to 3/8" elbow reducer	10
87034	3/8" to 1/2" elbow reducer	10
87035	1/2" to 5/8" elbow reducer	10
87036	1/4" socket	10
87037	3/8" socket	10
87038	1/2" socket	10
87039	5/8" socket	10
87042	1/4" valve	5
87043	3/8" valve	5
87044	1/2" valve	5
87045	5/8" valve	5

## Applications

- Recommended for single family residences with mini-split ductless and/or unitary ducted systems (AC/R: liquid/suction lines)
- Not to be used on hot gas/discharge lines

## Fitting warranty

- 5 year limited warranty. Terms and conditions apply. See warranty for details.

## Fitting Materials

- **Fitting body:**  
C3771, PC (Polycarbonate)
- **O-ring:** CR (Chloroprene rubber)

## Certifications

- **UL 207**
  - Strength and pressure tests: 12 & 13; 04/09; C22.2 No. 140.3; 5.11 & 6.1; 03/15
  - 10-day moist ammonia air stress cracking test: 18A.2; 04/09
- **UL 250**
  - Accelerated aging test – electrical heaters: Section 8.22
- **UL 1963**
  - Vibration test: Section 52.10
  - Pull test: Section 52.11
- **UL 157**
  - Gaskets and seals for refrigerant exposure



## Parameters

- **Continuous operating temp:** 250°F
- **O-ring temperature rating:** -40°F to 250°F
- **Maximum rated pressure (MRP):** 653 psi ~ 870psi
- **Min burst pressure:** 2,100psi
- **Vacuum pressure capacity:** 30 Microns
- **Tensile (grip) strength:** 3,911.4psi
- **Vibration resistance rating:** UL 1963
- **External leak rate:** 0.2 ounces/yr ↓

## Approved refrigerants

- R134a, R404A, R290, R500, R407A, R600a, R22, R410A, R407C, R32

## Compatibility

- **Tubing tolerance:** ASTM B280, UNI EN 12735
- **Approved tubing materials:** Copper to copper connection

## Tightening Torque

- **1/4":** 426.7 to 568.9psi
- **3/8":** 426.7 to 568.9psi
- **1/2":** 568.9 to 711.2psi
- **5/8":** 711.2 to 853.4psi
- **Service valve stem release torque:** The pipe should not fall out below 2,275.7psi

## Internal testing

- **Fatigue test:** Repeat 250,000 cycles test
- **Hydraulic test:** 979.01psi water pressure, no leakage
- **Hydraulic test service valve:** 903.2psi
- **Leak test:** Air pressure 597.4psi, no leakage
- **Tubing falling test:** The copper tube should not fall out of the specified pieces below the following psi's:
  - **611.6psi**  
1/4" union, 1/4" elbow, 1/4" socket, 1/4" to 3/8" reducers, 3/8" to 1/2" reducers, 1/2" to 5/8" reducers
  - **1,359.8psi**  
3/8" union, 3/8" elbow, 3/8" socket
  - **2,425.1psi**  
1/2" union, 1/2" elbow, 1/2" socket
  - **3,790.5psi**  
5/8" union, 3/4" union, 7/8" union, 5/8" elbow, 3/4" elbow, 7/8" elbow, 5/8" socket



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